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A Framework of Blockchain Technology

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Abstract

With the introduction of Bitcoin by Nakamoto (2008), came a key underlying technology that holds great disruptive promise to many crucial industries: Blockchain. The nature of a decentralized, distributed ledger will truly change the way we currently trade and interact through its clear transparency and high integrity (Casey & Vigna, 2018; Sullivan, 2015). Based on trust, Blockchain allows various parties to be involved in transacting with each other without the need to know each other (Botsman, 2017; Deloitte, 2016; Drescher, 2017; Mauri, 2017). The purpose of this paper is to provide a framework for Blockchain by focusing on how Blockchain technology can be integrated and implemented into real world applications (Harvey, Moorman & Toledo, 2018; Iansiti & Lakhani, 2017). As this secure, robust and flexible technology can be applied to numerous industries with a plethora of applications and use cases, Blockchain for business can tremendously save costs, save time and mitigate risk (Gupta, 2017; Mauri, 2017). In particular, we will explore how the premise of provenance in traceability and tractability will affect our supply chains of today and tomorrow (Carson, Romanelli, Walsh, & Zhumaev, 2018; Casey & Wong, 2017; Yiannas, 2018). We will also discuss the technological limitations, the regulations and the social challenges that revolve around Blockchain and its adoption (Commission Nationale de l'Informatique et des Libertés, 2018; Croman, Decker, Eyal, Gencer, Juels, Kosba, Miller, Saxena, Shi, Sirer, Song, & Wattenhofer, 2016; Iansiti & Lakhani, 2017; Global Legal Research Center, 2018). In addition, we aimed to examine the interaction of between Blockchain and various relevant and pertinent emerging technologies such as artificial intelligence, quantum computing, 5G, IoT and among others (Carmichael & Lakhani, 2017; Loukides & Lorica, 2018). Further, we identify the conceivable implications – such as the effect on the workforce, among other concerns – both positive and negative, and how these would

affect us in both the short term and the long term (Schwartz, Wooll, & Monahan, 2019). Lastly, we investigate how and where Blockchain would evolve in the near and far future.

References

Botsman, R. (2017). The three steps of building trust in new ideas and businesses. *TED Conferences, LLC.* Retrieved from https://ideas.ted.com/the-three-steps-of-building-trust-in-new-ideas-and-businesses/

Carmichael, S. G. & Lakhani, K. (2017). Blockchain — What You Need to Know. *Harvard Business Publishing.* Retrieved from https://hbr.org/ideacast/2017/06/blockchain-what-you-need-to-know.html

Carson, B., Romanelli, G., Walsh, P., & Zhumaev, A. (2018). Blockchain beyond the hype: What is the strategic business value. *McKinsey & Company.* Retrieved from https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/blockchain-beyond-the-hype-what-is-the-strategic-business-value

Casey, M., & Wong, P. (2017). Global Supply Chains Are About to Get Better, Thanks to Blockchain. *Harvard Business Review Digital Articles*, *13*, 1-6.

Casey, M. J., & Vigna, P. (2018). In blockchain we trust. *MIT Technology Review.* Retrieved from https://www.technologyreview.com/s/610781/in-blockchain-we-trust/

Commission Nationale de l'Informatique et des Libertés. (2018). Blockchain and the GDPR: Solutions for a responsible use of the blockchain in the context of personal data. *Commission Nationale de l'Informatique et des Libertés.* Retrieved from https://www.cnil.fr/en/blockchain-and-gdpr-solutions-responsible-use-blockchain-context-personal-data

Croman, K., Decker, C., Eyal, I., Gencer, A. E., Juels, A., Kosba, A., Miller, A., Saxena, P., Shi, E. Sirer, E. G., Song, D., & Wattenhofer, R. (2016). On scaling decentralized blockchains. In *International Conference on Financial Cryptography and Data Security* (pp. 106-125). Springer, Berlin, Heidelberg.

Deloitte. (2016). Blockchain: A new mechanism for trust—no intermediary required. *Quartz Media, Inc.* Retrieved from https://qz.com/628581/blockchain-a-new-mechanism-for-trust-no-intermediary-required/

Drescher, D. (2017). *Blockchain Basics: A Non-Technical Introduction in 25 Steps.* Frankfurt am Main, Germany: Apress

Global Legal Research Center. (2018, June). *Regulation of Cryptocurrency Around the World.* The Law Library of Congress.

Gupta, V. (2017). The promise of blockchain is a world without middlemen. *Harvard Business Review, 6*(3), 2017.

Harvey, C. R., Moorman, C., & Toledo, M. (2018). How Blockchain Will Change Marketing As We Know It. *SSRN Electronic Journal.* doi: 10.2139/ssrn.3257511

Iansiti, M. and Lakhani, K. R. (2017). The Truth About Blockchain. *Harvard Business Review*, *95*(1), 118-127.

Loukides, M. & Lorica, B. (2018). *What is AI?* Sebastopol, CA: O'Reilly Media, Inc.

Mauri, R. (2017). Three features of blockchain that help prevent fraud. *IBM.* Retrieved from https://www.ibm.com/blogs/blockchain/2017/09/three-features-of-blockchain-that-help-prevent-fraud/

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. *Bitcoin.org.* Retrieved from https://bitcoin.org/bitcoin.pdf

Sullivan, T. (2015). Transparency, Trust, and Bitcoin. *Harvard Business Review, 93*(6), 118-119.

Schwartz, Hagel, J., Wooll, M., & Monahan, K. (2019). Reframing the future of work. *MIT Sloan Management Review, 60*(3), 1-6.

Yiannas, F. (2018). Industry Impact: Food Safety in the Global Supply Chain. *MIT Technology Review.* Retrieved from https://events.technologyreview.com/video/watch/frank-yiannas-walmart-food-safety-supply-chain/